DOCUMENT RESUME

ED 474 899 SP 041 461

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TITLE	Relationship between Teacher Efficacy and Beliefs about Education among Preservice Teachers.
PUB DATE	2002-11-00
NOTE	35p.; Paper presented at the Annual Meeting of the Mid-South Educational Research Association (29th, Chattanooga, TN, November 6-8, 2002).
PUB TYPE	Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	EDRS Price MF01/PC02 Plus Postage.
DESCRIPTORS	Elementary Secondary Education; Higher Education; Preservice Teacher Education; *Self Efficacy; *Student Teacher Attitudes; Student Teachers; *Teacher Effectiveness
IDENTIFIERS	Progressivism

ABSTRACT

Evidence suggests that teacher beliefs drive instructional pedagogy. Yet, although antecedents of educational beliefs have been identified (e.g., family influences), these factors tend to be immutable, thereby having only minimal implications for intervention. Teacher efficacy appears to offer a viable avenue for research on the antecedents of educational beliefs. This study examined the relationship between candidates' teacher efficacy and their educational beliefs. Participants were 70 candidates enrolled in introductory-level classes for education majors at a southeastern university. Candidates were administered the Witcher-Travers Survey of Educational Beliefs on the first day of class, which is a 40-item, 5-point Likert-type scale. Low scores indicate proclivity toward transmissivism, and high scores suggest a tendency toward progressivism. Participants were also administered the Teacher Efficacy Scale. Findings revealed no relationship between educational beliefs and personal teacher efficacy. Conversely, transmissive viewpoint was statistically significantly (moderately) associated with lower general teacher efficacy. Implications are discussed. (Contains 86 references.) (Author/SM)

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ED 474 899

Relationship Between Teacher Efficacy and Beliefs About Education Among Preservice Teachers

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Paper presented at the annual meeting of the Mid-South Educational Research Association, Chattanooga, TN, November 6, 2002.

SP041461

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Abstract

Evidence suggests that teacher beliefs drive instructional pedagogy. Yet, although antecedents of educational beliefs have been identified (e.g., family influences), these factors tend to be immutable, thereby having only minimal implications for intervention. Teacher efficacy appears to offer a viable avenue for research on the antecedents of educational beliefs. Indeed, teacher efficacy has been identified as a variable predicting differences in teaching effectiveness. Teacher efficacy comprises personal teacher efficacy (i.e., belief that one has the ability to induce student learning) and general teacher efficacy (i.e., belief that any teacher's ability to effect change is limited by factors external to the teacher such as home environment).

This study examined the relationship between candidates' teacher efficacy and their educational beliefs. Participants were 70 candidates enrolled in introductory-level classes for education majors at a southeastern university. Candidates were administered the Witcher-Travers Survey of Educational Beliefs on the first day of class, which is a 40-item, 5-point Likert-type scale. Low scores indicate proclivity toward transmissivism, high scores suggest a tendency toward progressivism. Participants also were administered the Teacher Efficacy Scale. Findings revealed no relationship between educational beliefs and personal teacher efficacy. Conversely, transmissive viewpoint was statistically significantly (moderately) associated with lower general teacher efficacy. Implications are discussed.

Relationship Between Teacher Efficacy and Beliefs About Education Among Preservice Teachers

Although the concept of teacher efficacy can be traced to Rotter's (1966) locus of control theory, most researchers credit the construct's origins to the 1970s RAND Corporation studies and to Bandura's (1977) social cognitive theory (Goddard, Hoy, & Woolfolk Hoy, 2000). Since the 1970s, a substantial amount of literature on teacher efficacy has evolved. Researchers have investigated the construct and its implications on such topics as student performance, student control, and job satisfaction.

Efficacy has been most often defined as a personality trait that enables one to deal effectively with the world (Barfield & Burlingame, 1974). More specifically, Tschannen-Moran and Woolfolk Hoy (2001) defined teacher efficacy as a teacher's "judgment of his or her capabilities to bring about desired outcomes of students' engagement and learning, even among those students who may be difficult or unmotivated" (p. 783). Efficacious people demonstrate behaviors that allow them successfully to produce desired outcomes and exercise control over events that affect their lives (Bandura, 1977, 1986). Efficacy, when related to educators, has been divided into general teacher efficacy and personal teacher efficacy (Ashton & Webb, 1982). Teacher efficacy is the belief that any teacher's ability to effect change is limited by factors external to the teacher such as home environment. In contrast, personal teacher efficacy refers to a teacher's belief that he/she possesses the necessary teaching skills to induce student learning (Soodak & Podell, 1996). Individuals' levels of efficacy range from high to low.

High Efficacy

Overall, high-efficacious teachers have more of a positive impact on student learning because of their teaching orientation than low-efficacious teachers (Anderson, Greene, &

Loewen, 1988; Ashton & Webb, 1986; Berman & McLaughlin, 1977; Gibson & Dembo, 1984; Greene, Anderson, & Loewen, 1988; Hoy & Woolfolk, 1993; Midgley, Feldlaufer, & Eccles, 1989; Moore & Esselman, 1992; Ross, 1992; Soar & Soar, 1982; Watson, 1991). This may be the result of qualities displayed by teachers who have high efficacy. For example, they are more humanistic or progressive in their approach, and this has shown a positive impact on student learning (Woolfolk, Rosoff, & Hoy, 1990). In addition, they devote more time to academic instruction and take greater responsibility for educating students who have learning difficulties (Dembo & Gibson, 1985). They are more organized (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998), less likely to criticize students for giving the incorrect response, and more likely to persist with a student in a failure situation (Tschannen-Moran et al., 1998). They are more open to new ideas and are more inclined to experiment with new methods to meet better the learning needs of their students (Gerges, 2001; Guskey, 1998; Tschannen-Moran et al., 1998). High-efficacious teachers take pride in their abilities to teach the "unteachable," and they do not ignore the problems that students from low socioeconomic status bring with them; they accept them and see them as potentially conquerable (Ashton & Webb, 1982).

A positive association also has been found between high levels of teacher efficacy and their students' sense of self-efficacy (Anderson et al., 1988; Greene et al., 1988). High levels of teacher efficacy also have a positive impact on student motivation (Midgley et al., 1989) and students' performance expectancies and appraisals (Midgley et al., 1989). High teacher efficacy also has been linked to positive teacher behaviors and outcomes. Specifically, Saklofske, Michayluk, and Randhawa (1988) found small but statistically significant positive relationships between teacher efficacy and the following teacher behaviors: lesson presenting, questioning, and classroom management skills. Further, Woolfolk and her colleagues (Woolfolk & Hoy, 1990;

Woolfolk et al., 1990) positively linked teachers' sense of efficacy to their beliefs about management, control, and motivation. This result was found for both preservice and inservice teachers.

Interestingly, compared to their low-efficacious counterparts, teachers with the highest levels of efficacy are less likely to refer students for special services (Meijer & Foster, 1988; Podell & Soodak; 1993; Soodak & Podell, 1993), are more likely to experiment with teaching techniques and instructional materials while seeking improved instructional methods (Allinder, 1994; Guskey, 1988; Smylie, 1988; Stein & Wang, 1988), and are committed to the profession of teaching (Coladarci, 1992; Evans & Tribble, 1986). Additionally, teachers high in personal efficacy typically demonstrate greater organization, planning, clarity in instructions, fairness with students, and enthusiasm for their subjects in their implementation of instruction (Allinder, 1994).

Efficacious teachers prefer collaborative work environments (Morrison, Walker, Wakefield, & Solberg, 1994) and are more receptive to changes associated with teaching initiatives and staff-development enterprises (Berman & McLaughlin, 1977; Fritz, Miller-Heyl, Kreutzer, & Macphee, 1995; Guskey, 1988; Poole, Okeafor, & Sloan, 1989; Rose & Medway, 1981; Smylie, 1988). Teacher efficacy also has been documented as a strong predictor of parental involvement (Hoover-Dempsey, Bassler, and Brissie, 1987), with efficacious teachers being less likely to regard teacher-parent relationships with apprehension (Parkay, Olejnik, & Proller, 1986). Finally, teacher efficacy has been found to be related to school-level measures such as academic emphasis, institutional integrity, and the influence of the principal (Hoy & Woolfolk, 1993).

Low Efficacy

In contrast, low-efficacious teachers tend to use a more custodial approach to education (Woolfolk et al., 1990; Bandura, 1993). They are oriented toward using severe management strategies in an effort toward maintaining a controlled instructional environment (Woolfolk & Hoy, 1990; Ashton & Webb, 1986; Barfield & Burlingame, 1974). In the workplace, teachers with low efficacy show higher rates of absenteeism and attrition (Richardson, 1996), are more likely to be offended by the behavior of low-achieving students, and tend to project the responsibility of student failure to the home environment, attributing the failure to genetics, parental influence, or to the students themselves (Ashton & Webb, 1982). When posing a question to a student, low-efficacy teachers also are more likely to give the answer themselves, ask a second student for the answer, or allow another student to call out the answer before the first student has time to give the correct response (Dembo & Gibson, 1985).

Sources of Efficacy Beliefs

Bandura identified four sources of efficacy beliefs: performance or mastery, vicarious experiences, verbal or social persuasion, and physiological and/or emotional states (Gresham, 2001). Performance or mastery refers to a teacher's experience in terms of success and failure. Success builds self-efficacy beliefs; failure undermines them. If success is too easily achieved, failure may seem devastating and result in discouragement (Goddard et al., 2000). Teacher efficacy beliefs also result from vicarious experiences such as when they hear success stories of colleagues and of other schools (Goddard et al., 2000). The third source affecting efficacy, verbal or social persuasion, stems from activities such as talks, workshops, professional development opportunities, and feedback about achievement, and these have a positive influence when paired with models of success and positive direct experience (Goddard et al., 2000). The final source of

self-efficacy beliefs, physiological and/or emotional states, impacts how people interpret their physical and emotional reactions. For example, tension and stress are often interpreted by individuals as signs of a lack of ability or of poor performance (Goddard et al., 2000).

There is evidence to support that a teacher's sense of teacher efficacy is highest during preservice years and decreases with teaching experience (Hebert, Lee, & Williamson, 1998). Preservice teachers have little understanding of the impact of outside influences on students' behavior in the classroom. They believe they can overcome aspects that may interfere with student achievement such as a student's learning problem or the negative forces in a student's background. With more experience, teachers rate these outside factors as having greater influence (Hebert et al., 1998). In particular, Soodak and Podell (1997) found that personal efficacy of preservice teachers is initially high during fieldwork and student teaching, but in the first year of teaching, the sense of efficacy falls dramatically.

Chronological age of a teacher is a mediating variable impacting teacher efficacy (Chester & Beaudin, 1996). For teachers entering the profession at an older age, self-efficacy beliefs increase with time, whereas they decrease for younger teachers. In contrast, self-efficacy beliefs of all experienced newly hired teachers tend to decline, with older teachers having slightly larger decreases than their younger counterparts (Chester & Beaudin, 1996). At young ages, both experienced and novice teachers with high levels of resources experience substantial declines in self-efficacy beliefs, whereas those with few resources experience slight increases. In contrast, older teachers, whether experienced or at the beginning of their careers and who have high levels of resources, report increases in efficacy beliefs (Chester & Beaudin, 1996). Teachers' views about the impact of their profession on students, or teaching efficacy, do not change with greater experience. Rather, teacher efficacy appears to reflect a set of ideas unaffected by personal

successes and failures (Soodak et al., 1997).

Belief Systems

Two major belief systems have emerged and present themselves in contemporary American public schools: The transmissive and the progressive viewpoints (Doll, 1996). Differences can be detected from even a cursory look at the teacher's role, process of learning, and beliefs about discipline.

In a transmissive model of education, the teacher is placed at the center of the learning process and is expected to transmit to students an ordered sequence of subject matter as well as a corpus of values (Witcher & Travers, 1999). Lecture and demonstration are regarded as primary methods for transmitting this information. Because of the necessity for students to learn the process and content of the skills-oriented, subject-matter curriculum, the teacher establishes a classroom that is task-oriented, with an emphasis on convergent thinking. Students are expected to engage in hard work, drill and repetition, memorization, and recitation. They are to put aside their personal interests and experiences and immerse themselves in the work of the classroom. Classroom rules are designed by the faculty and administrators of the school, and clearly stated consequences for misbehavior are outlined. School personnel serve in loco parentis as they assist students in adopting and coming to value the predesigned and accepted code of proper conduct (Witcher & Travers, 1999).

The progressive classroom has an ambience of informality, encompasses much activity, and promotes active sharing and learning. In a progressive model of education, the teachers' role is one of a guide whose primary task lies in motivating students. To accomplish this, the teacher creates problem-solving opportunities for students that are often based upon students' experiences. In addition, the teacher discovers connections between these experiences and the

material they are to learn and facilitates students' progression towards recognizing those connections. Furthermore, students learn by direct contact with people, places, and objects in conjunction with reading and hearing about them. Classroom rules emerge out of students' school and social experiences, and students are encouraged to investigate the reasons for having and obeying rules. Teachers endorsing a progressive view believe that "moral training is precisely that which one gets through having to enter into proper relations with others in a unit of work and thought" (Dewey, 1897, Article 2, paragraph 11).

Evidence suggests that teacher beliefs drive instructional pedagogy (Pajares, 1992; Richardson, 1996; Thompson, 1992). Yet, although antecedents of educational beliefs have been identified (e.g., family influences), these factors tend to be immutable, thereby having only minimal implications for intervention. Teacher efficacy appears to offer a viable avenue for research on the antecedents of educational beliefs. Indeed, teacher efficacy has been identified as a variable predicting differences in teaching effectiveness. Thus, the purpose of the present study was to examine the relationship between candidates' teacher efficacy and their educational beliefs. It was hoped that results from the present inquiry would simultaneously increase our understanding of teacher candidates' educational beliefs and teacher efficacy.

Method

Participants

Participants were 70 candidates enrolled in introductory-level classes for education majors at a southeastern university. The majority of the sample was female (76.8%) and Caucasian-American (81.2%). African-Americans represented 15.9% of the sample. With respect to the number of children, the distribution was as follows: 0 (83.1%), 1, (10.8%), and 2 (6.2%). Further, 19.4% of the participants preferred to teach in a public school in an urban area, 38.8%

wanted to teach in a public school in a rural area, and 32.8% wanted to teach in a public school in a suburban area. The remainder preferred to teach in either a church-sponsored private school (4.5%) or a non-denominational private school (4.5%).

Instruments and Procedures

During the first week of the class, participants were administered the Witcher-Travers Survey of Educational Beliefs (WTSEB; Witcher & Travers, 1999) and the Teacher Efficacy Scale (TES; Gibson & Dembo, 1984). The WTSEB was developed to assess preservice and inservice educators' views on education as related to progressive and transmissive approaches. This 40-item instrument first asks respondents to identify demographic information (e.g., gender, age). It then asks for reaction to statements about education. Using a 5-point Likert-type scale, respondents make one of five choices indicating their level of agreement with each statement: "strongly agree," "agree," "undecided," "disagree," or "strongly disagree." Half of the statements reflect a transmissive approach to education; the remaining half of the statements indicate a progressive approach. According to its authors, the transmissive/progressive framework is used only to organize statements and to reflect the dichotomy faced by educators over the last century, as illustrated in the works of such persons as John Dewey and Lev Vygotsky for the progressive view and those of Art Bestor and Robert Hutchins for the transmissive view (Witcher & Travers, 1999).

Sample items on the WTSEB that indicate a progressive view include (a) "The role of the teacher includes project director, learning consultant and, in a sense, psychological counselor" and (b) "If an elementary school student matures socially and emotionally but fails to make significant academic progress, the teacher can still believe he or she has had a successful year." A transmissive approach is reflected in items such as (a) "The teacher should be the determiner and

evaluator of all action in the classroom since she or he is morally expected to be such" and (b) "If a teacher and student reach an impasse on what should be learned in an independent study project, the teacher's will must prevail because of his or her greater experience and knowledge." The WTSEB can be completed in approximately 15 minutes and scored immediately by computer (Witcher & Travers, 1999). Possible scores range from 1 to 40, with higher scores indicating a tendency toward progressivism and lower scores indicating a tendency toward transmissivism. Scores falling between 17 and 23 indicate an eclectic approach. Witcher and Travers note that the terms *higher* and *lower* do not denote values of superiority or inferiority. As advocated by many researchers (e.g., Onwuegbuzie & Daniel, 2002a, 2002b, in press-a, in press-b; Thompson & Vacha-Haase, 2000), reliability coefficients always should be reported for the data at hand. Unfortunately, score reliability could not be computed for the WTSEB for the present study because participants were not scored as a group. Instead, each sample member's responses were scored individually.

The TES is a 16-item, 6-point Likert-format scale, ranging from "strongly disagree" to "strongly agree," in which teachers are asked to respond to items concerning their beliefs about their own effectiveness as a teacher, as well as their beliefs about the influence of teachers in general. The TES contains the following two subscales: personal teacher efficacy (9 items) and general teacher efficacy (7 items). The TES is the most commonly used measure of teacher efficacy (Henson, Kogan, & Vacha-Haase, 2001), leading Ross (1994, p. 382) to declare it as a "standard" instrument in the field. For the present study, the subscales generated scores that had a classical theory alpha reliability coefficient of .78 (95% confidence interval [CI] = .69, .85) for personal teacher efficacy and .60 (95% CI = .44, .73) for general teacher efficacy.

Data Analysis

An independent *t*-test was used to compare scores on the two subscales of the TES to scores obtained by inservice teachers in previous research. In addition, Pearson's product-moment correlation coefficient was used to assess the relationship between teacher efficacy and educational beliefs among the preservice teachers.

Because the TES typically has been administered to inservice teachers, little is known about the construct-related validity of scores pertaining to the TES for preservice teachers. Therefore, scores on the TES were submitted to a principal axis factor analysis in order to examine the factor structure of the TES for preservice teachers. Although confirmatory factor analysis is recommended to test hypothesized patterns of factor loadings (Onwuegbuzie & Daniel, in press-a), this technique was not used in this investigation because of the relatively small sample size. Confirmatory factor analysis involves statistical significance testing, which is extremely affected by the sample size. In any case, as noted by Henson (2002), with the exception of Roberts and Henson (2000, 2001), virtually all examinations of the factor structure of the TES have used exploratory factor analytical techniques.

Results

The mean personal teacher efficacy score was 38.53 (SD = 5.60), whereas the mean general teacher efficacy score was 25.97 (SD = 4.94). Interestingly, a dependent *t*-test revealed that the preservice teachers reported statistically significantly higher levels of personal teacher efficacy than general teacher efficacy ($t = 4.99, p < .0001$), with a Cohen's (1988) d moderate effect size of .59. Further, although the preservice teachers in the current inquiry reported very similar ($t = 0.43, p > .05$) general teacher efficacy scores to the 192 inservice teachers (M = 25.64, SD = 5.62) in Soodak and Podell's (1993) study, they obtained statistically significantly

higher ($t = 5.31$, $p < .0001$) personal teacher efficacy scores than did the inservice teachers. The effect size associated with this difference was 0.74, which can be considered large (Cohen, 1988). In contrast, the present sample reported statistically significantly lower personal teacher efficacy scores ($t = -1.82$, $p < .05$) and general teacher efficacy scores ($t = 2.83$, $p < .01$) than did a U.S. sample in Collins (2002) cross-cultural study of preservice teachers. These differences yielded effect sizes of 0.42 and 0.65, respectively, which were both in the moderate range.

The inter-item correlation matrix was used to undertake a principal component analysis with orthogonal rotation, as recommended by Kieffer (1999). The initial factor analysis yielded four factors using the eigenvalue-greater-than-one rule, also known as K1 (Kaiser, 1958). The scree plot (Cattell, 1966; Zwick & Velicer, 1986) suggested a three-factor solution. Because the K1 rule almost always overestimates the number of factors (Zwick & Velicer, 1986), the three-factor solution was used. An exploratory factor analysis was then conducted that extracted three factors with orthogonal rotation. The three-factor solution explained 47.30% of the total variance in the correlation matrix. Using a cut-off point of |.40|, one item (i.e., Item 11) failed to load on any factor. Also, the third factor contained only two items (i.e., Items 1 and 14), with Item 1 also loading significantly on Factor 1. Thus, Factor 3 contained only one item that indicated a unique factor pattern/structure coefficient on one factor (using a |.40| criterion). Moreover, the score reliability pertaining to this third factor (containing two items) was negative (i.e., -.28). Therefore, Item 11 and Item 14, which both represented the general teacher efficacy subscale, were removed, reducing the number of items on the TES to 14.

After removing Item 11 and Item 14, a principal components analysis was undertaken. On this occasion, the scree plot suggested a two-factor solution. Therefore, an orthogonal rotation was conducted. Using the |.40| criterion, all items loaded on only one factor. A principal

components analysis with an oblique (i.e., promax) rotation also was conducted on the 14-item correlation matrix. This led to no changes in the structure. Further, the correlation between the two factors was minimal (r = .02), suggesting that the orthogonal solution was the most appropriate (Henson, 2002; Pedhazur & Schmelkin, 1991). An examination of the *trace* (i.e., the proportion of variance explained, or eigenvalue, after rotation; Hetzel, 1996) revealed that these two factors explained 41.95% of the total variance, with Factor 1 (personal teacher efficacy) explaining 24.68% of the variance and Factor 2 (general teacher efficacy) explaining 17.27% of the variance. The score reliability pertaining to the 9-item teacher efficacy subscale was .78 (as before because no items were removed from this scale) Table 4 presents the factor pattern/structure coefficients for the obtained solution. However, the score reliability pertaining to the 5-item general teacher efficacy subscale increased to .69 (95% CI = .56, .79). This represented a 15% increase in score reliability. As such, the final solution confirmed studies documenting a two-factor solution (e.g., Coladarci, 1986; Coladarci & Breton, 1997; Gibson & Dembo, 1984; Henson, 2002; Soodak & Podell, 1993), and contradicted research reporting three-factor solutions (e.g., Guskey, 1988; Woolfolk & Hoy, 1990), as well as those reporting other divergent solutions such as a one-factor solution (e.g., Deemer & Minke, 1999).

Insert Table 1 about here

In summary, the principal components analysis left the personal teacher efficacy subscale intact but reduced the general teacher efficacy subscale by two items (i.e., from 7 to 5 items). Therefore, the 5-item scale was used to address the major purpose of the study, which was to examine the relationship between teacher efficacy and educational beliefs. A series of Pearson

product-moment correlation coefficients, after applying the Bonferroni adjustment, revealed no statistically significant relationship between scores on the personal teacher efficacy subscale and scores on the WTSEB ($r = .12$, $p > .025$). Conversely, scores on the general teacher efficacy subscale were statistically significantly positively related to scores on the WTSEB ($r = .31$, $p < .025$). Specifically, the transmissive viewpoint tended to be associated with lower general teacher efficacy, whereas the progressive orientation tended to correspond to higher general teacher efficacy. Using Cohen's (1988) criteria, this suggests a moderate relationship.

Discussion

Teacher efficacy as a potential variable for predicting educational outcomes has been studied for approximately 25 years, stemming from the work of RAND researchers who developed two items to measure this construct (Armor et al., 1976; Berman, McLaughlin, Bass, Pauly, & Zellman, 1977; Henson, Bennett, Sienty, & Chambers, 2002). As noted by Woolfolk and Hoy (1990), since the conceptualization of this construct, teacher efficacy has been found to be the variable that most consistently predicts student learning and behavior. However, with the exception of a few studies (e.g., Hebert et al., 1998; Henson, in press; Henson et al., 2002; Hoy & Woolfolk, 1990, 1993; Soodak & Podell, 1997; Spector, 1990), the overwhelming majority of research in the area of efficacy has been conducted on inservice teachers. Thus, relatively little is known about the extent to which teacher efficacy predicts other cognitive, affective, and personality variables among preservice teachers. As such, the present investigation has extended the knowledge base in the area of teacher efficacy among this population.

The finding that preservice teachers in the sample reported higher levels of personal teacher efficacy and general teacher efficacy than did inservice teachers in Soodak and Podell's (1993) study, with the former difference reaching statistical significance, contradicts the findings

of Spector (1990). Spector found that personal teacher efficacy among undergraduate students increased linearly during the 4-year program of study. He also observed a quadratic trend for general teacher efficacy, with scores increasing linearly for the first three years of their undergraduate programs and then declining after student teaching. The relatively higher levels of teacher efficacy found in the current inquiry also are incongruent with Hoy and Woolfolk (1993) who documented that personal efficacy was highest among inservice teachers who had taken extra graduate courses in education. Conversely, the present results are consistent with Hebert et al. (1998) who demonstrated that levels of teacher efficacy are highest during preservice years but decrease with teaching experience. According to these researchers, teacher efficacy peaks during preservice years because teacher candidates are not fully cognizant of the role that external forces can play on students' behavior and performance in school. Because they have little or no direct experiences teaching, they are more likely to have inaccurate perceptions of the challenges that face teachers than are inservice teachers, and, in turn, preservice teachers are more likely to overestimate what teachers in general (i.e., general teacher efficacy) and they in particular (i.e., personal teacher efficacy) can accomplish in the classroom. Moreover, preservice teachers believe that they can overcome disruptive forces in students' backgrounds including any learning problems (Hebert et al., 1998). Interestingly, Soodak and Podell (1997) found that personal efficacy of preservice teachers is initially high during fieldwork and student teaching, but in the first year of teaching, the sense of efficacy falls dramatically.

Although it might be concluded that the high levels of efficacy reported by the present sample represent a positive finding, this is not necessarily the case. In fact, to the extent that their high efficacy stems from a lack of awareness of how challenging it is for teachers to overcome negative forces, this result may indeed be a real cause for concern. For example, a preservice

teacher who begins her teaching career with an unrealistically high level of efficacy may be more likely to drop out of the profession within the first few years. According to the Department of Education, 22% of new teachers leave the profession within their first three years; in high poverty areas, the number is estimated to be closer to 50% (McCarren, 2000). As such, future research should investigate the possible link between efficacy and drop-out rate among inservice teachers. Such a relationship, if found, would have implications for teacher educators. In particular, it would suggest that while educators should strive to increase teacher candidates' levels of personal efficacy and general efficacy, as these variables have been associated with positive student outcomes (Anderson et al., 1988; Ashton & Webb, 1986; Berman & McLaughlin, 1977; Dembo & Gibson, 1985; Midgley et al., 1989; Gibson & Dembo, 1984; Greene et al., 1988; Hoy & Woolfolk, 1993; Moore & Esselman, 1992; Podell & Soodak, 1993; Ross, 1992; Soar & Soar, 1982; Soodak & Podell, 1993; Watson, 1991; Woolfolk et al., 1990), teacher outcomes (Allinder, 1994; Berman & McLaughlin, 1977; Coladarci, 1992; Evans & Tribble, 1986; Fritz et al., 1995; Gerges, 2001; Guskey, 1988, 1998; Tschannen-Moran, et al., 1998; Poole et al., 1989; Rose & Medway, 1981; Saklofske et al., 1988; Richardson, 1996; Smylie, 1988; Stein & Wang, 1988; Woolfolk & Hoy, 1990; Woolfolk et al., 1990), parental outcomes (Hoover-Dempsey et al., 1987; Parkay et al., 1986), and school-based outcomes (Hoy & Woolfolk, 1993), they should attempt to ensure that these levels are realistic.

Further, the potential problems stemming from unrealistically high levels of teacher efficacy indicate that preservice teachers should be given the opportunity to observe experienced teachers in their classrooms beginning early in their training programs so that they can establish realistic levels of teacher efficacy as soon as possible. That is, the use of field-based and professional development school opportunities early in teacher education programs might be

beneficial for teacher candidates in terms of shaping both efficacy levels and educational beliefs. Indeed, according to Tschannen-Moran et al. (1998), efficacy change in preservice teachers can be accomplished by providing "more opportunities for actual experiences with instructing and managing children in a variety of contexts with increasing levels of complexity and challenge to provide mastery experiences and specific feedback" (pp. 235-236).

In recent years, the TES has come under close scrutiny as a measure that yields valid scores. In particular, Henson (in press) and Tschannen-Moran et al. (1998) have identified problems with the TES. While these researchers and others agree that the personal teacher efficacy scale generates scores that have consistently been reliable and valid, the same cannot be stated for the general teacher efficacy scale (Henson, in press). Moreover, some researchers have questioned the dimensionality of the TES in particular and the teacher efficacy construct in general (cf. Coladarci & Fink, 1995; Guskey & Passaro, 1994; Tschannen-Moran et al., 1998). In any case, as noted above, the examination of the TES scale typically has been conducted on inservice teachers. Consequently, an exploratory factor analysis (i.e., principal components analysis) was undertaken in the present investigation.

The principal components analysis confirmed studies documenting a two-factor solution (e.g., Coladarci, 1986; Coladarci & Breton, 1997; Gibson & Dembo, 1984; Henson, 2002; Soodak & Podell, 1993), and contradicted research reporting three-factor solutions (e.g., Guskey, 1988; Woolfolk & Hoy, 1990), as well as those reporting other divergent solutions such as a one-factor solution (e.g., Deemer & Minke, 1999). This result suggests that a two-dimensional model of teacher efficacy may be applicable for preservice teachers. However, the fact that two items had to be deleted from the general teacher efficacy subscale, coupled with the fact that the score reliability pertaining to this revised scale was marginal (i.e., .69), suggest that more work likely

is needed on this scale—at least for preservice teachers. Indeed, Gibson and Dembo (1984) called for continued psychometric evaluation of the TES. Moreover, although the exploratory factor analysis conducted in the current investigation was very informative, confirmatory factor analyses are needed on this scale. Such analyses would allow teacher efficacy researchers and psychometricians to assess the extent to which TES scores are factorially invariant across samples (Henson, 2002). Disturbingly, as noted by Henson (2002), confirmatory factor-analytic techniques in teacher efficacy research are virtually non-existent, with the exception of Roberts and Henson (2000, 2001).

In addition, this study should be replicated using other measures of teacher efficacy. In this respect, Henson et al.'s (2002) 12-item Means-End Teaching Task Analysis multidimensional measure of teacher efficacy shows promise. This instrument measures teacher efficacy in a specific context, namely, providing instruction, facilitating motivation, and managing behavior. This scale was created in light of Tschannen-Moran et al.'s (1998) contention that a means-end task analysis (weighing of resources against difficulties) precedes teachers' efficacy judgments and that teaching competence is essential in efficacy judgments.

The major finding in the current study was that although no association emerged between personal teacher efficacy and educational beliefs, general teacher efficacy was statistically significantly related to educational beliefs, with a moderate effect size. Specifically, the transmissive orientation tended to be associated with lower general teacher efficacy, whereas the progressive viewpoint tended to correspond to higher general teacher efficacy. The fact that personal teacher efficacy and general teacher efficacy differentially predicted educational beliefs supports the view that these two dimensions of teacher efficacy are conceptually, theoretically, and empirically distinct (Gibson & Dembo, 1984). Indeed, the correlation between these two

measures (using the revised general teacher efficacy subscale) was $r = .01$ ($p > .05$).

The relationship between general teacher efficacy and educational beliefs suggests either that general teacher efficacy, at least in part, determines preservice teachers' educational beliefs, or that preservice teachers' educational beliefs influence general teacher efficacy to some extent, or that the relationship is bi-directional and reciprocal. Thus, future research should seek to determine the causal nature of this relationship. Qualitative techniques can play an important role here. However, because the TES was administered to the sample members on the first day of class and in their first semester of their teacher education program, the preservice teachers would not have had the opportunity to study different teaching methods nor had the opportunity to try out different methods in the classroom.

As such, it is unlikely that educational beliefs affect general teacher efficacy for this population. Rather, it is more likely that the reverse is true. That is, it is more plausible that general teacher efficacy is an antecedent of educational beliefs. Support for this causal direction stems from the fact that teachers with high levels of teacher efficacy are more open to new ideas and are more likely to experiment with new methods to meet better the learning needs of their students (Gerges, 2001; Guskey, 1998; Tschannen-Moran et al., 1998), are more likely to experiment with teaching techniques and instructional materials, seek improved instructional methods (Allinder, 1994; Guskey, 1988; Smylie, 1988; Stein & Wang, 1988), and are more receptive to changes associated with teaching initiatives and staff development enterprises (Berman & McLaughlin, 1977; Fritz et al., 1995; Guskey, 1988; Poole et al., 1989; Rose & Medway, 1981; Smylie, 1988). All of these traits are associated with a progressive style of teaching (Witcher & Travers, 1999).

That efficacious preservice teachers are more likely to have a progressive orientation also

is consistent with Woolfolk and Hoy (1990) who found that teachers with high efficacy display more humanistic tendencies with respect to how they viewed students, and they prefer to exercise less control over their students. The current relationship also is consistent with Henson (in press) who reported that efficacious teachers are less interventionist regarding their instructional and classroom management beliefs—again indicative of progressivism (Witcher & Travers, 1999). Further, because one would expect efficacious preservice teachers to be less afraid of failure than their counterparts, it is likely that they are more apt to adopt a progressive orientation, which involves more risk-taking by nature of its informal, versatile, and experiential style (Witcher & Travers, 1999) than does transmissivism.

It should also be noted that the marginal score reliability for the general teacher efficacy scale likely attenuated the relationship between general teacher efficacy and educational beliefs (Cousin & Henson, 2000; Henson, 2001; Onwuegbuzie & Daniel, 2002b, in press-a, in press-b; Thompson, 1994). Thus, it is possible that the re ationship between general teacher efficacy and educational beliefs is even stronger. This suggests that replications are needed of this finding before any generalizations can be made about the effect size pertaining to this relationship. Again, a further modification of the TES (adding more items) and the use of other measures of efficacy might be useful here.

Evidence exists that levels of efficacy can change in the preservice years (Henson, 2002; Housego, 1992; Hoy & Woolfolk, 1990; Ross, 1994). Thus, an important implication of the present investigation is that to the extent that efficacy influences educational beliefs, interventions that appropriately increase or decrease levels of efficacy may lead to desired shifts in educational beliefs. Alternatively stated, educational beliefs that are considered optimal by the majority of teacher educators, inservice teachers, school administrators, and other stakeholders

might be able to be instilled in preservice teachers by changing levels of efficacy, which, in turn, might increase the chances of the desired philosophy being realized in the classroom when the preservice teachers begin their careers. However, only continued research in the field of teacher efficacy can possibly establish how realistic this outcome is.

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Table 1: *Factor Pattern/Structure Coefficients from Principal Components Analysis of the TES With Varimax Rotation*

	Factor Loading[1]		
Item	1 (Personal Teacher Efficacy)	2 (General Teacher Efficacy)	Communality Coefficient
12. If a student does not remember information that I gave in a previous lesson, I will know how to increase his/her retention in the next lesson.	**.792**	-.048	.236
9. When the grades of my students improve, it is usually because I found more effective teaching approaches.	**.677**	.250	.509
10. If a student masters a new math concept quickly, this might be because I knew the necessary steps in teaching that concept.	**.677**	.088	.537
6. When a student gets a better grade than he usually gets, it is usually because I found better ways of teaching that student.	**.617**	.027	.449
7. When I really try, I can get through to most difficult students.	**.584**	-.015	.300
15. If one of my students could not do a class assignment, I would be able to accurately assess whether the assignment was at the correct level of difficulty.	**.577**	-.056	.381
13. If a student in my class becomes disruptive and noisy, I feel assured that I know some techniques to redirect him quickly.	**.571**	-.168	.342

Table 1 (continued)

Item	Factor Loading[1] 1 (Personal Teacher Efficacy)	2 (General Teacher Efficacy)	Communality Coefficient
5. When a student is having difficulty with an assignment, I am usually able to adjust it to his/her level.	**.527**	-.146	.629
1. When a student does better than usual, many times it is because I exerted a little extra effort.	**.449**	.186	.522
8. A teacher is very limited in what he/she can achieve because a student's home environment is a large influence on his/her academic achievement.	-.087	**.788**	.466
3. The amount that a student can learn is primarily related to family background.	-.030	**.732**	.629
2. The hours in my class have little influence on students compared to the influence of their home environment.	.179	**.691**	.354
4. If students are not disciplined at home, they aren't likely to accept any discipline.	-.079	**.665**	.337
16. Even a teacher with good teaching abilities may not reach many students.	.021	**.429**	.184
Trace	3.451	2.417	5.872
% of variance explained	24.68	17.27	41.95

[1] Coefficients in bold represent loadings with significant effect sizes within each factor.

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